

# Northeast Area e-News

## MLRA Soil Survey Region 12—Spring 2003

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### MO Message

*Bruce Thompson, MLRA Soil Survey Region 12 Team Leader*

The National Cooperative Soil Survey Conference will be held in Plymouth, Massachusetts June 16-20, 2003. We expect about 100 participants including university professors and agricultural experiment station directors, consultants, and soil scientists from NRCS, Bureau of Land Management, and the Forest Service, as well as soil scientists from Canada, China, and South Africa.

The week's discussions will start with two sessions on Monday morning: Major Land Resource Area Correlation and Mapping in Soil Survey; and Building Inference Models in GIS to Map Soils (SOILIM Concept). The conference will conclude on Friday after two sessions: NASIS Database—Introduction to Interpretation Modules and Fuzzy Logic; and Soil Quality—Field Methods and Applications. These four sessions will be open to all participants and hopefully will be of interest to consultants as well.

Wednesday will be spent traveling the area in southeast Massachusetts to learn about the Cranberry agricultural practices, the soil types cranberries are typically grown on, and the typical landscapes. Personnel from the US Army Corp of Engineers will discuss the Cape Cod Canal, which at its period of development, was truly a major engineering undertaking. We will travel west of the Cape Cod area and observe what is truly considered "dense till". The east central part of Massachusetts is dominated by drumlins that are common in Connecticut and Massachusetts and continue into the southern and central part of New Hampshire. Bill Puckett and his staff from the Soil Quality Institute will demonstrate their field techniques at the field stops.

There will be six open committee discussions:

1. Selling Soil Science to Society—Promoting Partnerships
2. Ecological Interpretations and Principles
3. New Inventory Techniques and New Delivery Systems in Production Soil Survey
4. Recruitment and Retention of Soil Scientists in Soil Survey
5. Water Movement and Water Table Monitoring in Soil Survey
6. Hydric Soils National Committee

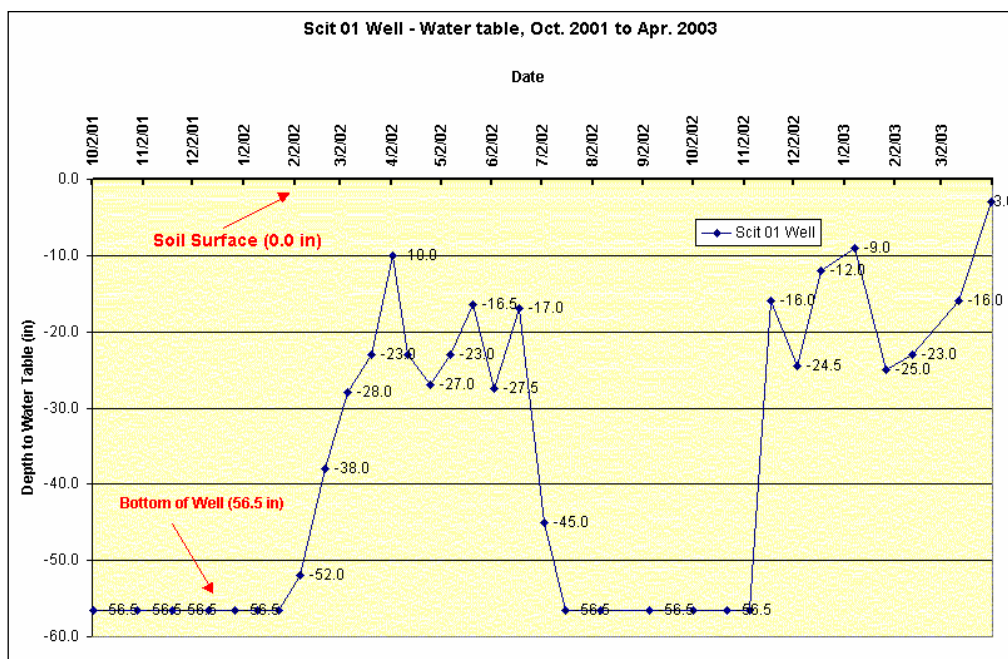
We are looking forward to welcoming you to the National Cooperative Soil Survey Conference. This year's conference is located in one of the more interesting parts of the country; I am sure you will find it to be an extremely enjoyable experience.

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## SE Massachusetts Water Table Monitoring Well Network

*By Jim Turenne, Soil Scientist, Plymouth County, Massachusetts*

Water table data is one of the most important properties used for interpretations reported in soil surveys. The Plymouth County Soil Survey update has been monitoring water table levels since the early 1990s. Working with the Massachusetts Coastal Zone Management, local town health agents, UMASS, and the Buzzards Bay Program we have installed and monitored 66 ground water index wells throughout Plymouth and Bristol Counties. The wells are installed on various landforms and landscape positions using the procedure outlined by the US Army Corps of Engineers. Several of the sites also had temperature probes installed at 50 and 25-cm depths to better determine the start and end of the growing season. Complete profile descriptions were taken at many sites to classify the series and provide information on hydrologic characteristics and redox morphology. Well observations are typically made twice a month during the fall through spring and less frequent after the water level drops below the well depth. Data collection duration ranges from several seasons to many years.



The wells are used to monitor seasonal water table fluctuations to assist town Boards of Health and health agents guide onsite wastewater disposal system location, design, and permitting. The data is also used by the soil survey to adjust the water table depths and duration in the interpretive tables. Thus far we have been able to determine that the dates of seasonal high water tables (typically reported as Nov. to May for moderately well drained till soils) actually

start later (mid-December) and continue through mid-June. Water table elevations also tend to be higher than the depths reported in the tables. It is understood that although the water table may be higher, the soils are not reduced until a later time (oxygenated rainfall, cooler soil temps, etc.) and thus the morphology does not always match the high water levels. We also have soil temperature data that is showing that the soils only reach biological zero for a brief period in Jan-Feb. (and some years the soil temp never drops below biological zero) indicating longer growing seasons.

We are currently working with a UMASS graduate candidate named Abigail Childs, who will be analyzing our data, determining soil type and redox morphology at each well, and provide a summary of water table elevations as part of her independent study project. She will also compare actual data to the reported soil survey data to determine if the survey accurately reports water table data.

Information and current monthly data (for the South Coastal index well sites) is available at <http://nesoil.com/obswell/>. Soil temperature and climate data is available at: <http://nesoil.com/climate>.

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## Throw Out Your Crayons!

*By Wayne Hoar, State Soil Scientist, Maine*

In April, Lindsay Hodgman was invited to present the NRCS's Soil Data Viewer to the Maine State Planning Office at a meeting of their Comprehensive Planning Working Group. There were about twenty at this meeting representing several different state agencies, including Department of Transportation, Land Use Regulation Commission, Inland Fish & Wildlife, Maine Department of Agriculture, and Maine Forest Service. The Soil Data Viewer is an Arcview extension used with the NRCS Soil Survey Geographic Database (SSURGO) data sets. Since Lindsay recently put together customized soil data sets for the eight SSURGO certified survey areas in Maine, there has been a great demand for the data as well as a lot of positive feedback on the usability of the soil data sets for comprehensive planning purposes. These data sets are useable by both inexperienced and experienced Geographic Information System (GIS) users.

Lindsay created a file with the eight most commonly used soil properties, map unit symbol, map unit name, drainage class, farmland class, HEL class, hydric designation, hydrologic group, and potential for low density development. Seven of the eight properties can be generated from Soil Data Viewer, but the potential for low density development rating was available from ME-NRCS Growth Management publications that have been created for each county in Maine. The inexperienced GIS user can import the file into Arcview and simply create a map based on any of these eight categories to get a visual picture of how much prime farmland is in their town or county, or what areas are suitable for development. The experienced GIS user can still use the same file but take it a step further and use the Soil Data Viewer to create maps and reports displaying other soil properties like water table depth, pH, and available water holding capacity or crop yield. With the advent of GIS the world of coloring with crayons is over and the possibilities of interpretive maps are endless.

The SSURGO data for Kennebec County, Maine should be available in June, bringing the total number of soil surveys in Maine with digital data available to nine. Plans are to complete the digitizing of the Androscoggin-Sagadahoc and Southern Somerset surveys within the next year. If you have any questions about using this data please give Lindsay a call.

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## National Cooperative Soil Survey Conference Web Site

*By Shawn Finn, MO-12 Soil Data Quality Specialist—Databases*

***Please update your bookmark!*** Massachusetts has migrated to a new agency web site following NRCS policy and standards effective April 29, 2003. This new web site has the same URL as before: <http://www.ma.nrcs.usda.gov/>.

The web address for information on this site has changed. The web page for the National Cooperative Soil Survey Conference in Plymouth, Massachusetts June 16-20, 2003 can be accessed by clicking on the News tab at the top of the Massachusetts page or directly by accessing the following link: <http://www.ma.nrcs.usda.gov/technical/mo12ncsswpc.html>.

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## Job Announcement

*By Bruce Thompson, MO-12 Team Leader*

MO-12 will be announcing a request to fill the vacant Soil Data Quality Specialist position starting the week of June 1<sup>st</sup>. The primary duty for this position is quality assurance functions of soil survey activities in assigned areas of the 10-state MO-12 region. The position will be housed in the Amherst state office and will be at the GS-12 level. Although the principal assignment is correlation in nature, the new individual will participate in many other activities such as technical reviews, SSURGO database reviews, official soil series description preparation, and maintaining the classification file. The position will require travel within the 10-state area.

The Connecticut Valley is a very nice place to live and we are within a 10-mile radius of Amherst College, Hampshire College, Smith College, Mount Holyoke College, and the University of Massachusetts. Boston is only 2 hours to the east and Cape Code is only a 3-hour drive.

Please review the job announcement and really consider applying for the position. The job is varied and also an excellent career move.

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## Using a Personal Digital Assistant (PDA) for Soil Survey

*By Jim Turenne, Soil Scientist, Plymouth County, Massachusetts*

In the spring 2002 issue of Northeast Area *e-News*, I wrote an article on the use of PDA (hand-held computer) and the Arc PAD program for soil survey operations and data collection. The article was written during my initial trials with the device shortly after I began using it. This is a follow-up on the progress I've had with the device and some of my thoughts on using PDA's in the field.



The equipment I have been using is a Compaq IPAQ 3600 and Arc Pad 6.01. The ArcPad software is mobile mapping and geographic information system (GIS) technology. ArcPad provides database access, mapping, GIS, and global positioning system (GPS) integration to users out in the field via hand-held and mobile devices. One of the problems I had with my initial trials was the need to hook a GPS to the PDA via a cable to track your location on a topographic map or orthophoto and provide information of the resource inventory map coverages. The cable connection was fragile and awkward to use. To resolve this problem I purchased an expansion pack (which also allows you to add up to 1 GB of memory and extra battery power) and the Compact Flash (CF) Teletype GPS receiver which connects directly to the PDA via the CF port (see photo). I have had very good results with the CF GPS to date as far as accuracy, position lock time, and tracking ability in wooded areas (although the leaves have not come out yet).

The Plymouth County Soil Survey has been using GPS to assist with field mapping since the early 1990s. All of our field data (pedon descriptions, laboratory sampling sites, GPR investigations, index maps, monitoring well sites, field notes, etc.) is geo-referenced, stored as GIS coverages, and made available to our customers. To assist with field note collection I developed (with excellent assistance from Dwain Daniels at NCGC) a customized form to make data entry easier with the ArcPad program. The form provides drop down menu choices for each field along with other features.

The following are my personal opinions on using this equipment for field soil survey operations (others may have different opinions). Although the PDA and the ArcPad program have many useful aspects for soil survey work, the underlying problem with using these devices is the "dirty" nature of our work and the fragility of the equipment. Dirt, dust, water, and the rugged nature of field mapping just do not mix well with computers! I am aware that there are more rugged versions of the PDA but these units are much more expensive and a lot heavier and bulky to use. Battery life is also an issue particularly when using the GPS; the expansion pack provides a second battery, which helps a lot. There has been talk of some day using the PDA's to collect pedon descriptions by entering the data in the field directly into the pedon description program. I do not think this will ever be feasible due to the problems mentioned above and I always prefer a paper copy of a good pedon description form. The ArcPAD program works great but it does require some knowledge of GIS. Another program that works well is the Pocket Navigator from Maptech. If you have the Terrain Navigator CD with the USGS topo maps, this program allows you to copy the quad onto the PDA and track your location with the GPS. You can also create points on the map and even link a voice recording to the point for quick field note dictation. The points can then be transferred to a GIS file. In Plymouth we use Mylar copies of the topos to overlay onto our color infrared photos to pinpoint your location. PDA's are great for providing documentation in the field; I have copies of all the OSEDs in New England on my unit along with Soil Taxonomy, Soil Survey Manual, National Soil Survey Handbook, Field Guides, etc. Overall the device is nice to have but not a necessity, give me a good color infrared aerial and I'll be happy. Contact me if you have any questions: 508-295-5151 x112.

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